(42)

Anais da Sociedade de Biologia de Pernambuco XIII (2), 1955

INSTITUTE OF MYCOLOGY — UNIVERSITY OF RECIFE

Pernambuco — Brazil
Publication n.º 42

BASIDIONEUROMYCOSIS ON MAN

A. Chaves Batista *
J. Alberto Maia **
Rolf Singer ***

Here we want to put in focus and report one Higher Basidiomycete fungi as agent of a neurous system disease in a man, as a preliminary account, due to the fact that such a subject is of the most scientific importance.

We want to call attention of mycologists and neurologists for the fact we are analyzing, because this happens to be the first time in the world that a fungus of the Basidiomycetes class is found developing a pathogenic acctitivity over man.

From a pacient, J. F. Araujo, 24 years old, Fig. 1, presenting atypic meningite symptoms (endocraneous hypertension plus dullness of mind) without meningite signs, Maia have proceeded the examination of the basal electrical brain activity, observing the presence of alfa waves with irregular modulation in the frequences

.....

* Institute of Mycology — University of Recife — Brazil
** Faculty of Medicine — University of Recife — Brazil
*** Fundacion Miguel Lillo — Universidad de Tucuman — Argentina

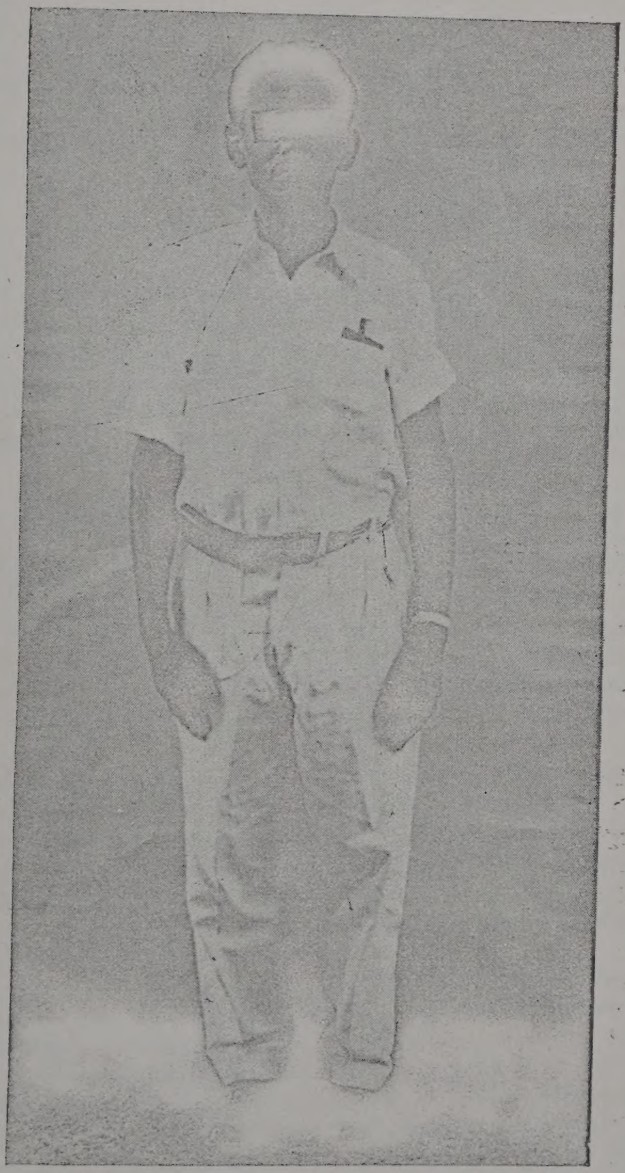

Fig.: 1 — The pacient's picture.

of 9-10-12 c/s, with slow waves of 4.5 and 6 c/s in the frontal and central regions, also of irregular modulation, of media voltage, interrupting the rithm of bottom system, specially at left side; the occurrence of hyperventilation confirm the abnormal status. This picture suggested the existence of an actual lesional process, but diffusus even if localised on anterior regions of the brain hemispheries, with a slight prevalence to the left side. Laboratories examinations were taken with the following results:

Serum sanguineous:		
Wassermann reaction (Assis)	—	Negative
Kahn standards	—	»
Kline diagnostic	—	»
V.D.R.L. (micro)	—	»
Citocol	—	»
Liquor rachis-cephalic		
(Suboccipital punction)		
Liquid not colored, limpid, without blood and coagules.		
Total Proteins (Nissl)	—	0,200/00
Globulin reaction:		
Nonne-Apelt (phase I)	—	weakly positive
Pandy	—	» »
Weichbrodt	—	
Coloidal reaction:		» »
Takata-ara	—	» »
Benjoim		0000 12221000000
Cytological examination		
Pleiocits	—	123,8 p./mm³ (Nageotte)
Immunological reactions:		
Wassermann (Assis)	—	0,1 negative
» »	—	0,5 »
» »	—	1,0 c³ c negative

Urine — Summary	*Hemogram:*
Densidad — 1015	Hematiae 340.000 mm
Reaction — alcalin	Leucocits 6.600 mm
Albumin — absent	Mielocits 0,20
Glicose — »	Metamielocits 0,20

Biliar pigm. — trace		Stick	420
		Segmenta-	
Biliar acid — presence		ted	2820
Urobiline — trace		Eosino-	
		phyls	620
Amorph sediments — presence		Basophyls	120
		Monocits	520
		Lympho-	
Urea	0,102 gr/00	cits	1720

The therapeutic under which the pacient has been submitted from 20/11/54, when he was taken to the hospital, based on penicillin, streptomicin and tetracin, did not give the slightest modification in the results of Laboratory test; but when the treatment was made with injectable iodine, a very sensible variation in the liquor rachis-cephalic composition was found, with the following data:

Date of examination: 12/5/55
Total proteins (Nissl) 0,100/00
Pleiocits 20,0 p/m³ (Nageotte)

remaining the other values unchanged.

Part of this limpid liquor rachis-cephalic sample was taken under rigorous asceptic conditions and planted in 16 petri dishes containing Sabouraud-agar, potato-dextrose-agar and Blood-agar, culture media.

Chaves Batista used then the streak and the dilution plate cultures technics as well as the deposition in the media of a small drops from the liquor as another tecnic to obtain the development of a microorganism in a pure state if present some microorganism in the liquid in study. From all the technics employed developed a very uniform whitish lanosis mycelium, the same in each dish, without any contamination. Fig. 2.

These plate-cultures of the fungus under 20 days, room temperature, ranging from 24-28.°C., were spreaded, plan, without smell, velvety-wollen, whitish, having a cream reverse, later on from the aerial mycelium arised some stromatic digitiformis structures, hairy, Fig. 3 that expanded at last in a shell-like or spatulate carpophores, Fig. 4, with well marked phototropism; those carpophores had reached 8 x 6 mm in their hymenial portion while the stipe had reached 10 x 3 mm ressembling in their morphology those of *Schizophyllum*. Fig. 5.

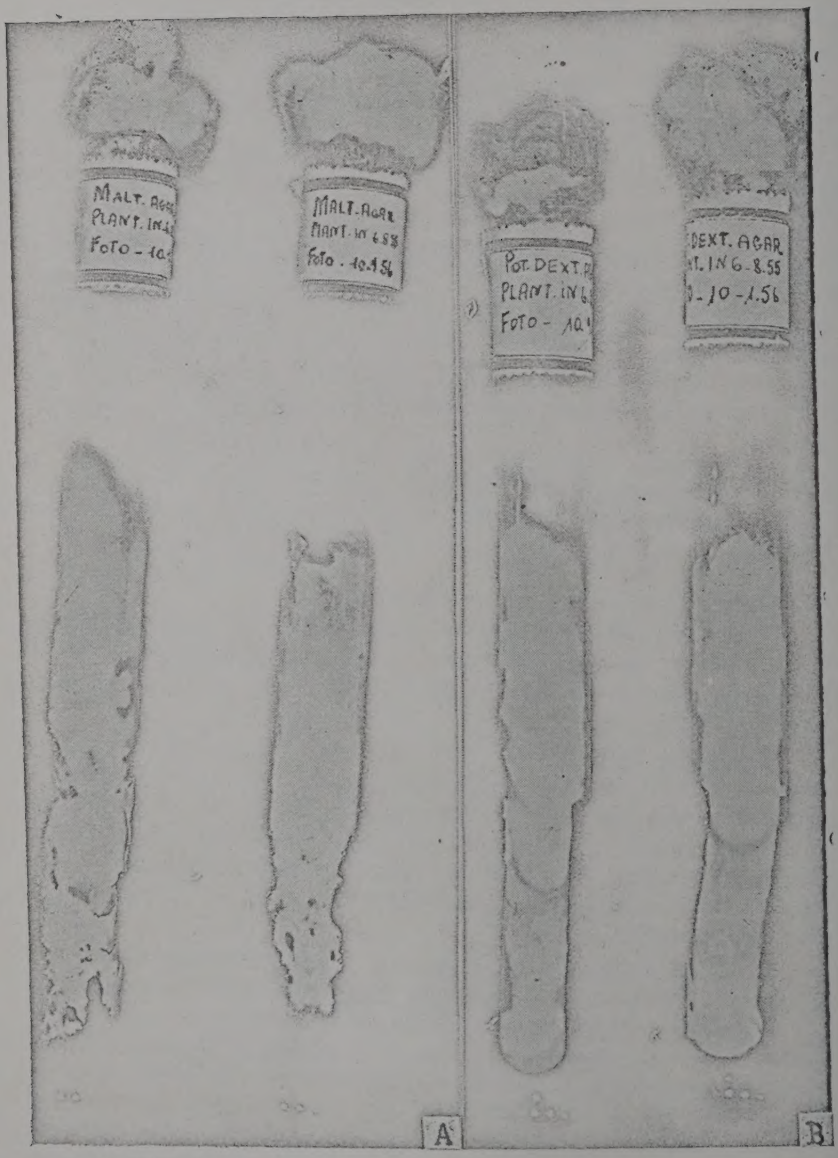

Fig.: 2 — A — The fungus in malt-agar medium; B — The fungus in potato-dextrose-agar medium;; both are 5 monthes old.

Fig.: 3 — The digitiform and hairy stromatic structure as a carpophore primordium inside a tube of malt-agar, 5 monthes old.

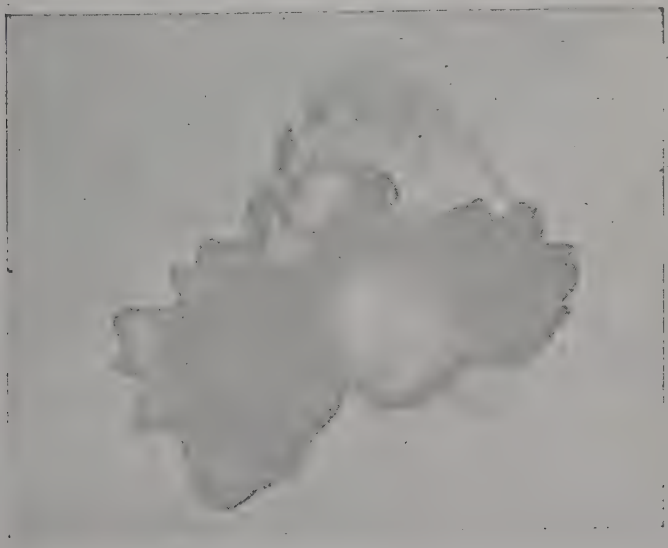

Fig.: 4 — Carpophores view.

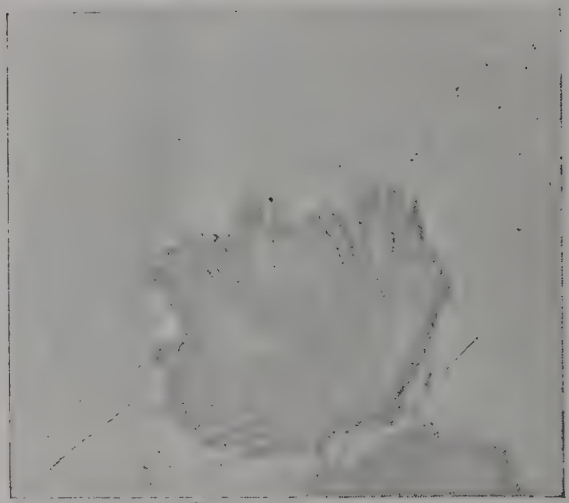

Fig.: 5 — The lamellate hymenium of the carpophore.

The taxonomic works had begin in a parallel line and under cooperation of the Authors (Chaves Batista, Maia and Singer) in the University of Recife and in the University of Tucuman.

In despite of the security given by the uniformity of the culture in all the 16 Petri dishes in which we have planted the material from the liquor rachis-cephalic, putting aside the possibility of isolation of a saprophytic organism, we took a new sample and started all over again, in September the 8th, 1955; the pacient at that time was no more hospitalised, but we was able to get from him another occipital punction.

From the second sample, following the same procedure in 19 Petri dishes, 12 of them containing potato-dextrose-agar, and 7 containing malt-agar, we reach the same results.

These results obtained of a sample collected from the same pacient four monthes after the first sample, stands out the relation between the fungus and the clinic picture of this desease.

The Authors, however, are still working in the experimental field looking for a clear explanation of this problem.

We equally are working in the taxonomy of this organism, no doubt it is a Basidiomycete, from the order Agaricale, giving sexual and conidial fructifications.

Since some of the conidial formations of the carponhores vaguely remind one of some heterobasidial fungi, material was sent to Dr. Martin, Iowa State University, specialist of the group. He discovered some true homobasidia in apparently more advanced material, with four sterigmata and spores which seem to be sclerotized basidiospores with thick smooth wall, an oil drop, and a appendage like that found on spores of such Gasteromycetes as *Bovistella*. Fig. 6. Singer aiso observed scattered but typical clamp connections.

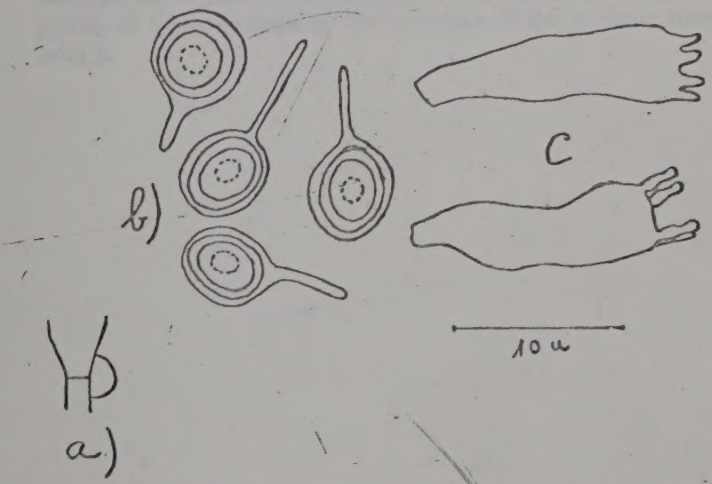

Fig.: 6 — A) Clamp connection; B) Spores; C) basidia.
(acc. to a sketch by G. W. Martin).

The carpophores themselves are truly lamellate, and the lamellae show a certain degree of "double" structure which might be interpreted as proving affinity with the common and widely distributed genus *Schizophyllum*. The species of *Schizophyllum* are almost cosmopolitan, and grow on dead and living vegetable matter.

The carpophores observed on the surface of the culture of the organism under observation are considerably softer than any species of *Schizophyllum* ever are, and approach in this regard rather the consistence of *Clitopilus septicoides*. The majority of the hyaline and smooth hyphae of the carpophores and the vegetative hyphae of the abundant mycelium are clamp-less.

The significance of the species, thus far undescribed, rests in the habitat which is extraordinary for fungi in general, but quite

unexpected and unprecedented as far as a gill fungus is concerned. It is more than probable that this organism is pathogenic in humans, and in this case, it is the first example of a Basidiomycete showing up in medical mycology.

The respective organism is now under further observation in order to determine its role as a pathogen and its life cycle. The Authors shall publish a complete study on this fungus, from all points of view, as soon as the progress of the present research permits it.